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ABSTRACT

A study examined whether citizens of Pennsylvania are aware of and able to access the Internet, how they are using online state resources, and whether there is a parity of access to advanced information services between rural and urban citizens. Data were gathered via telephone surveys of 1,000 residents from 62 of Pennsylvania's 67 counties. Findings indicate that although the number of households with personal computers had clearly increased since 1998, segments of the population continued to be disadvantaged. Urban and rural residents both lagged behind suburban residents. Rural residents without children in the home were the least likely of any group to have a personal computer. Higher educational and income levels were the primary predictors of whether a household had a personal computer, regardless of the area people lived in. Achieving at least some college education was a key element in reducing levels of dislike of technology. Despite growing use and availability of the Internet in all areas and across all segments of the population, urban and rural areas were still disadvantaged. Economics was the primary roadblock to access for urban residents. Lack of Internet service, especially high-speed connections, was the primary problem for rural residents. Nearly one-third of residents had accessed governmental services information online, with about 10 percent using the Internet for political information. Recommendations for policy are discussed. (TD)

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Cybercitizens of the Commonwealth: How Rural and Urban Pennsylvanians Access and Use the Internet

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Cybercitizens of the Commonwealth:
How Rural and Urban Pennsylvanians Access and Use the Internet

A report by:
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Bloomsburg University of Pennsylvania

This project was sponsored by a grant from the Center for Rural Pennsylvania, a legislative agency of the Pennsylvania General Assembly.

The Center for Rural Pennsylvania is a bipartisan, bicameral legislative agency that serves as a resource for rural policy within the Pennsylvania General Assembly. It was created in 1987 under Act 16, the Rural Revitalization Act, to promote and sustain the vitality of Pennsylvania's rural and small communities.

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Introduction

As the 20th Century began, new technologies - electricity, the telephone, and later radio and television - emerged and transformed virtually every aspect of daily life in the United States. With the passing of every decade, previously undreamed applications of these technologies appeared. Each became powerful new influences in education, government, work, and the home. No longer considered luxuries to be indulged by the most educated and economically secure, these innovations have became woven into the fabric of everyday life so that today we don't think about them as "technologies," but as utilities to which citizens have demanded both access and availability. These technologies presented our society and public policy makers with challenging new problems, necessitating a vigorous discussion regarding: the commitment of public and private resources to develop the technologies, how to best insure rights of access, and whether or not regulation was necessary.

As we begin the 21st Century, we are faced with a similar infusion of new communication technologies – in particular, the creation and availability of the personal computer (PC) and the Internet - both of which give every indication of stimulating greater change and challenge than ever before. In addition, the pace at which these technologies are evolving is unprecedented.

The penetration of these technologies into everyday life has been dramatic. It has been estimated by Seth Godin (founder of Yahoo.com) that at the start of 1997 there were 7,000 websites on the World Wide Web. In July of 1999 Newsweek reported there were over 34 million websites consisting of over 1.2 billion pages. There is reliable research (from Jupiter Communications - one of several companies "tracking" the growth of new technologies), which shows that the Internet is currently doubling in size every 12 months. It is estimated that by 2002, the Internet will be in more U.S. households than cable TV, and that more U.S. homes will have the Internet than will subscribe to a newspaper.

In addition, the economic impact of the Internet and related technologies is staggering. The U.S. Department of Commerce (DOC) has concluded that "information technologies" are responsible for 35% of U.S. economic growth since 1995, electronic commerce is doubling every nine months, and e-commerce is growing 16 times faster than the rest of the economy. The DOC also credits the Information Technology sector with helping to keep inflation low. NUA Surveys (another prominent Internet research group) has data, which indicates that by 2004 the amount of money spent on Internet advertising will surpass that spent on: network television, consumer magazines, and cable/satellite TV. The reason the "push is on" for Internet advertising is simple – more people are accessing the Internet every day. The average number of pages "viewed" by the average American with Internet access has more than doubled – from 353 per month in 1999, to 709 by early fall of 2000. NUA estimated that Internet access in U.S. households has increased by more than 35% in 2000.

Rationale for this Research

The purpose of this report is to present data relating specifically how citizens of the Pennsylvania are using the Internet. Interest in this project was stimulated by the growing amount of data about national trends, little of which was specific to the Commonwealth or any other state. Of primary concern were issues of how citizens in rural and urban areas access and use the Internet. Professor James E. Tomlinson, of Bloomsburg University, conducted preliminary research into the issues involved and prepared the grant application that was then funded by the Center for Rural Pennsylvania.

During the summer of 1999, the U.S. Department of Commerce (DOC) published two studies ("The Emerging Digital Economy II"- and "Falling Through the Net - Defining the Digital Divide") in an effort to examine the national data (collected in 1998) regarding these new technologies and the impact they were having on society and the national economy. Higher levels of household income and education were significant factors in predicting if a household would have a PC and/or the Internet. For some of the data, race appeared to be a factor in whether or not people had access to the technologies. The report specifically cited rural areas and inner cities as the locations least likely to have access to personal computers and the Internet. The report concluded that there was a "digital divide" between those who had PCs and Internet access and those who did not.

Some of this data was specific to the Commonwealth. For example: Pennsylvania was ranked 39th out of the 50 states for households with a personal computer – 39.3% having a PC. The Commonwealth was ranked 29th out of the 50 states for households with Internet access – 24.9% with access.

A review of Pennsylvania's state-sponsored websites shows that the DOC report generated a great deal of attention. Several of these sites quote sections of the reports as justification for the wide range of initiatives undertaken by Pennsylvania to encourage technology education and e-commerce, and to improve access by citizens of the Commonwealth.

Despite the growing commitment by the state to the use of digital communication as a means of interacting with the citizens of Pennsylvania, there has been little data on how individuals actually use and access the Internet. This study was proposed, in part, to gauge if citizens of the Commonwealth are aware of and able to access the Internet, and how they are using online state resources that have been provided for them.

Goals of this research project:

1. Provide an analysis of the parity of access to advanced information services between rural and urban citizens of the Commonwealth.
2. Provide data regarding the types of Internet use.
3. Provide base-line data for future research.
4. Provide policy recommendations based on analysis of survey results to further enhance Pennsylvania's position as a leader in technology.

Methods

Given the scope of this project, the most feasible method was to conduct a telephone survey of Commonwealth residents. The Center for Opinion Research at Millersville University was selected to conduct the survey and worked with Research Director Tomlinson to not only formulate the questionnaire but also carefully select a scientific and representative sample of residents. After completion of initial drafts of the survey, a pre-test was administered to finalize the questionnaire and train personnel for administering the survey instrument.

Using appropriate measures to guarantee privacy, and meet all state requirements for Human Subjects Research, 1,000 residents (aged 18 or over) were interviewed. Computer software was employed to insure a sample that was selected through random digit dialing. A total of 500 residents from urban counties, and 500 residents from rural counties took part in this survey. Using this method, the data in this report can be analyzed by type of county (urban/rural counties as defined and identified by the Center for Rural Pennsylvania – counties with more than 50% of residents in "rural" communities are identified as rural counties).

Participants were also asked during the survey to identify the "type of area" in which they lived as urban, suburban, or rural – since in some counties such distinctions exist. This allows data analysis of similarities and differences between not only counties (as noted in the paragraph above), but also types of areas across these jurisdictions. Based on this 'self-identified' area type, a total of 186 urban, 284 suburban, and 510 rural residents were interviewed (20 participants refused or did not know how to describe their area). Completed surveys came from all regions of the Commonwealth, and included residents from 62 of Pennsylvania's 67 counties. Data was collected from residents with an age range of 18 to 98.

These responses were then statistically matched and weighted to U.S. Census Bureau data to ensure various demographic groups were represented proportionally. The data presented in this report will document that in some ways, urban/suburban/and rural residents have similar profiles for PC ownership and Internet use, and yet there are important differences that will be highlighted.

Research Findings

Section 1: Pennsylvanians With Personal Computers at Home

Data in this survey indicates that the number of personal computers in Pennsylvania households has increased dramatically since 1998. Statewide, over 62% of all households now have a PC. As might be expected, from the DOC national data, both urban and rural residents continue to lag behind their suburban counterparts for having a personal computer at home (see Chart 1). While more than 2 out of 3 suburban households have a PC, both urban and rural households have a similar degree of PC ownership, at 56% and 58% respectively.

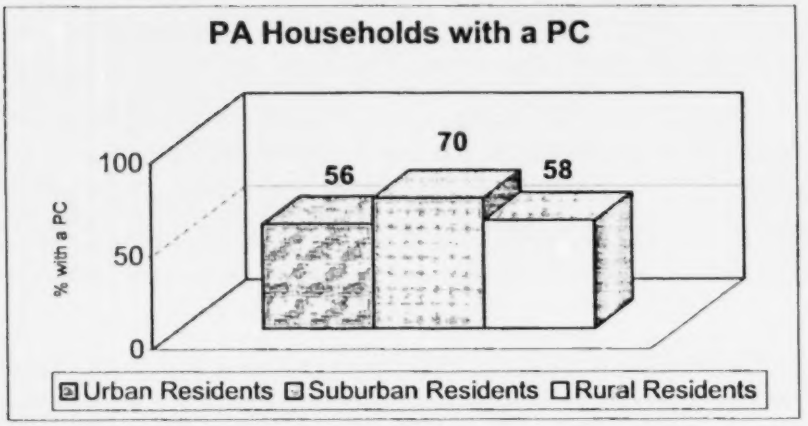

Chart 1

When the data is examined by type of county, residents of rural counties are found to be less likely to have a PC in their homes than those in urban counties. The data suggests that the presence of suburban areas, which has the highest ownership of personal computers, contributes greatly to the difference between counties (see Chart 1-A). The data suggests that rural residents who are located in urban counties are slightly more likely to have a PC than rural residents who are in rural counties.

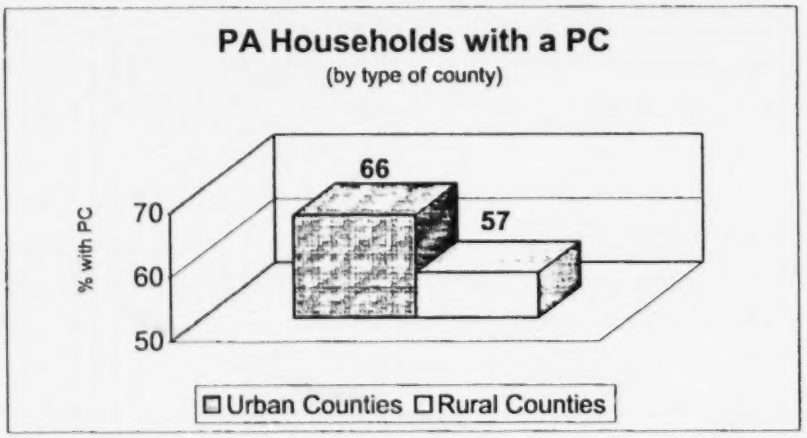

Chart 1-A

In the 1998 DOC data about Pennsylvania, it was suggested that only 39.3% of all households in the Commonwealth had a PC. The data in this survey seems to support that finding (this study found 40% of homes with a PC in 1998). When residents were asked how long they had a PC at home, the data reveals that a substantial number of households have purchased PC's in the past 2 years. Overall, the number of households reporting that they have obtained a PC since 1998 is 31%. Among the fastest growing groups obtaining

personal computers, are older Pennsylvanians, and yet persons under the age of 45 are 2 times more likely to have a PC at home than a person over the age of 55.

When examined by region, the data shows that more than 40% of rural Pennsylvania households have had a PC for 2 years or less. Combining the responses for the "3-5 years" and the "2 years or less" data reveals that nearly 3 out of every 4 personal computers in rural Pennsylvania have been obtained in the past 5 years (see Chart 2). Suburban residents are most likely to have had a PC at home for longer than 5 years (over 43%), and urban residents reported that 1 out of 3 households have had a PC for more than 5 years. For urban residents the "5-year" figure is 67%. Once again, the data is somewhat similar for urban and rural residents, but for different reasons that will be discussed later in this report.

Despite these clear gains, especially since 1998, rural households continue to lag behind the state average for having a PC at home. These residents rank even lower, if they are located in a rural county.

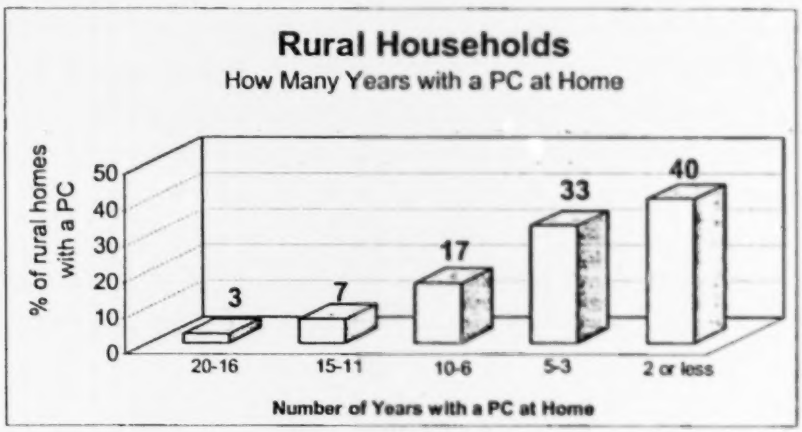

Chart 2

(*Note: This data was collected during the spring and early summer of 2000 – prior to the Pennsylvania state-sponsored "tax-free week" incentive program for the purchase of personal computers, and the annual "back-to-school" buying season, which in previous years has seen an increase in the numbers of personal computers purchased.)

When the level of household income is used to examine who has a PC at home, the data reveals that households with an annual income over $30,000 have been much more likely to have a PC (see Chart 3). Households with income over $30,000 are between 2 and 5 times more likely to have a personal computer. The disparity between low and high-income households is similar in both urban and rural counties, and is also similar for urban, suburban, or rural residents. This disparity continues despite the increasing numbers of lower income households that have obtained a PC since 1998.

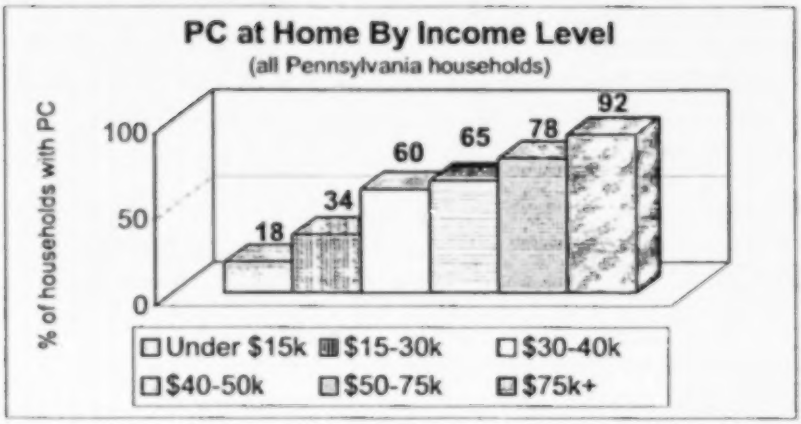

Chart 3

As in the case of the data regarding the increase in PCs in rural households, those with incomes under $30,000 continue to lag behind the rest of the Commonwealth. In 1998 fewer than 1 in 6 of these households had a PC. Today nearly 1 in 4 have a PC. But when compared to those with income over $30,000, it is the more affluent who are much more likely to have a PC at home, regardless of the type of area in which they live.

Education also plays a major role in whether or not a personal computer is in a household. This data is similar across the Commonwealth, regardless of the type of area residents live in. A person with at least "some college" is about 3 times more likely to have a PC than a person without a high school diploma. Graduating from high school doubles the likelihood that someone will have a PC at home, but these individuals still lag significantly behind those with at least "some college" education. Clearly, having a 4-year college degree (even more significantly for those with a graduate degree) is a primary indicator of which households will have a personal computer (see Chart 4).

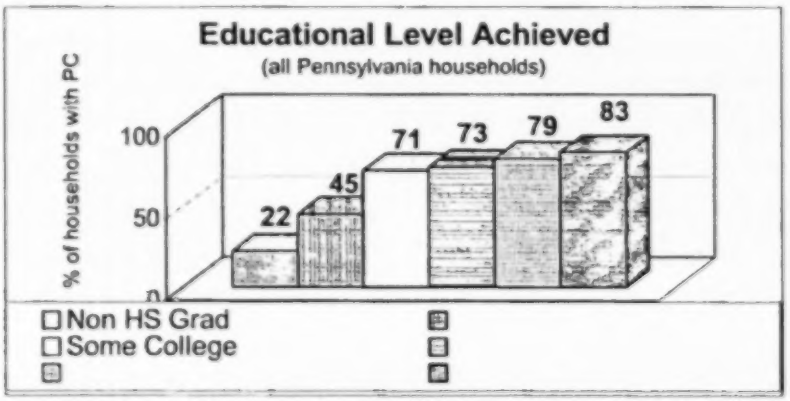

Chart 4

When asked if they "dislike" computers and technology, responses from urban and rural residents were similar. However, when these responses are examined according to the educational level of the respondents, it is clear that those persons without any college education are between 3 and 7 times more likely to express "dislike" of technology (see Chart 5).

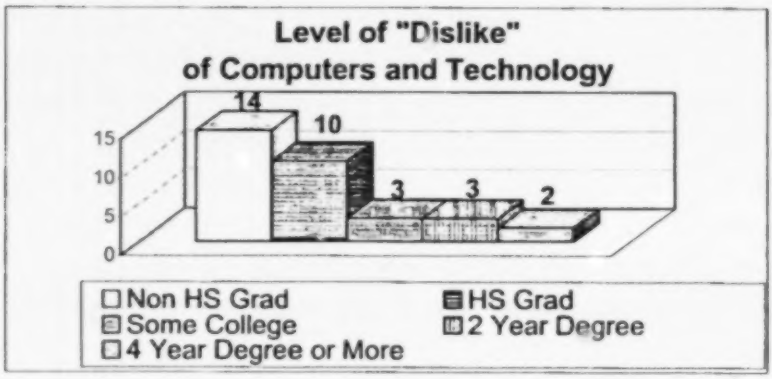

Chart 5

While the data presented above reveal some similarities between urban and rural counties, there are some important differences as well. Previous research data, including the DOC reports mentioned earlier, indicated that having children in the home increases the likelihood that a household would have a personal computer. This survey finds data that supports those findings. More than 3 out of 4 households, regardless of region, which have children under the age of 18, report that they have a personal computer. However, when the data from households that do not have children is examined, it is clear that it is households in rural counties without children that are among the least likely groups in Pennsylvania to have a PC (see Chart 6). Not only is their PC ownership 34 points below rural households with children, but is nearly 20 points below the average ownership for the entire Commonwealth (62% of all households have a PC). Clearly, having children at home is a major reason for purchasing a personal computer.

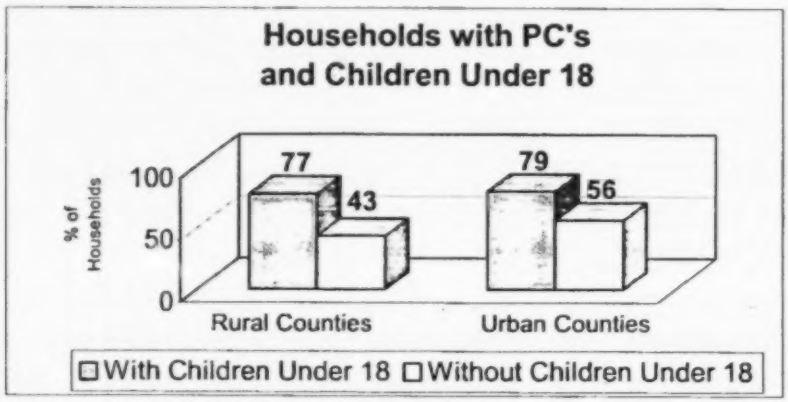

Chart 6

Summary of Findings Regarding Personal Computers

The data suggests that there is some good news to report in Pennsylvania, but there are some areas of concern as well. Although the number of households with personal computers has clearly increased since 1998, there are segments of the population that continue to be disadvantaged. Urban and rural residents both lag behind suburban residents. Most notably, households in rural areas without children appear to be falling further behind. Higher educational and income levels continue to be primary predictors for whether or not a household has a personal computer, regardless of the type of area people live in. Achieving at least "some college" education is a key element in reducing levels of "dislike" of technology. Perhaps the most striking finding in this data is how far behind the rural counties are in the penetration of PCs into rural households, with rural county residents without children in the home being among the least likely of any regional group in the Commonwealth to have a PC.

Section 2: Access to the Internet in Pennsylvania

Access at Home:

Just as there has been an increase in the number of households with personal computers, access to the Internet has grown since 1998. This increase is across every demographic category. However, just as was the case with data about personal computers, rural households continue to lag behind statewide figures for having Internet access at home. This is evident when the data from urban and rural counties is compared (see Chart 7).

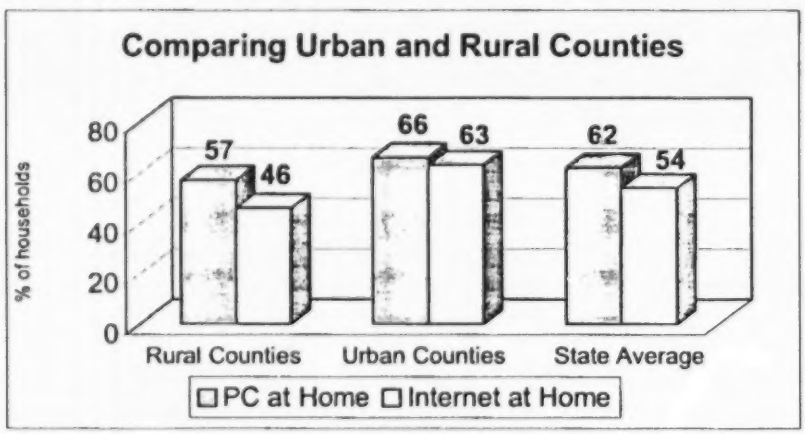

Chart 7

Rural residents who live in rural counties are consistently among the least likely to have a PC and/or Internet access at home. Nearly 90% of all Pennsylvanians who have a PC at home also have an Internet connection. Yet, in rural counties, less than 80% of rural residents with a PC have an Internet connection. These residents have the lowest incidence of Internet connections found in this research.

Age and income level are also significant predictors of Internet access, just as they were for PC ownership. Households with income over $30,000 are about 2 times more likely to have Internet access as those with incomes under $30,000. Nearly 87% of higher income households (over $50,000) have Internet access. Access to the Internet is also related to age across all regions of the Commonwealth (see Chart 8).

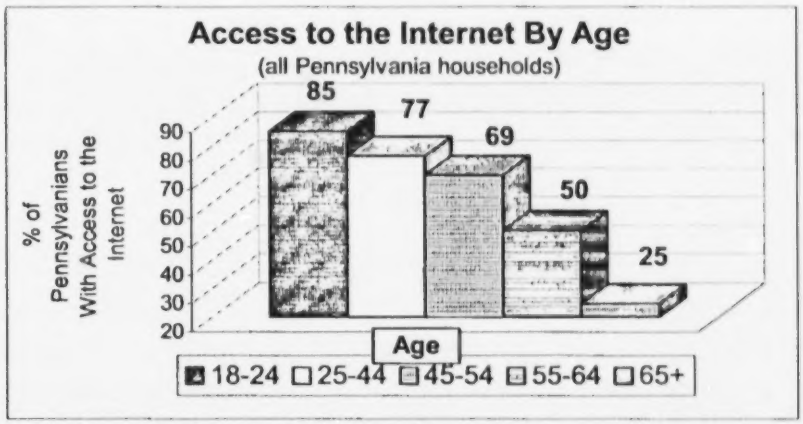

Chart 8

Reasons for Accessing the Internet:
Residents across most demographic groups (including county or type of area) responded with similar answers: information searches (89%), email (88%), educational research (69%), news (65%), entertainment information (64%), job related research (54%), download software (48%), shopping (46%), sports information (41%), games (40%), federal government information (36%), job search (34%), replace long distance phone calls (33%), video/audio electronic mail (30%), state government information (30%), political information (24%), learn to use the Internet (23%), local government information (22%), chat (21%), take courses (8%).

Some differences between rural and urban residents did appear. Rural residents are more likely, than any other group, to respond that they use the Internet "instead of making long distance phone calls." Rural residents are more likely to visit websites of federal government agencies. Rural residents are much less likely than other Pennsylvanians, to visit websites of local government (this may suggest that local government entities in rural areas are less likely to be "on the web" than their urban/suburban counterparts – or perhaps rural residents are more likely to already be aware of local government officials and actions). One additional difference in the survey is that 49% of residents in rural counties reported that they use the Internet to 'shop,' while in the urban counties the figure is 43%.

How Pennsylvanians Have Learned to Use the Internet:
Most residents respond that they are "self taught" (with a statewide average response of 68% reporting they are "self taught" with rural residents reporting at the lowest level - about 60%). Learning from a "family member" was the next most frequently cited

response – with rural residents being 4 times more likely to have learned from a family member, than those in urban areas. Urban and suburban residents are nearly 2 times as likely to have learned to use the Internet "at work." The data demonstrates that these rural county residents are older as well as less likely to be online as their counterparts in urban counties. The most striking feature in the data is that people who are online are self-taught. However, for those not willing or able to take on this task, there are differences in what may be of assistance to them. This may be especially true for Internet training in rural counties.

Access to the Internet Outside of the Home:
When asked where else they access the Internet, residents did respond with: another person's computer, community centers, libraries, schools, etc. However the most likely place that the Internet is accessed outside the home is at work. Across most variables, including the region where people live, the data is similar. When educational level was examined, the data reveals that a person with at least a high school diploma is more than 2 times more likely than a non-high school graduate to live or work where the Internet is available. A person with at least "some college" is nearly 4 times more likely to have Internet access at work and at home than a non-high school graduate, and is much more likely to have access than a high school graduate. As was the case in the data regarding personal computers at home, higher educational levels is a predictor of having access to the Internet at work (see Chart 9). The data about income levels is very similar – the higher the person's income, the more likely the person has access to the Internet at work.

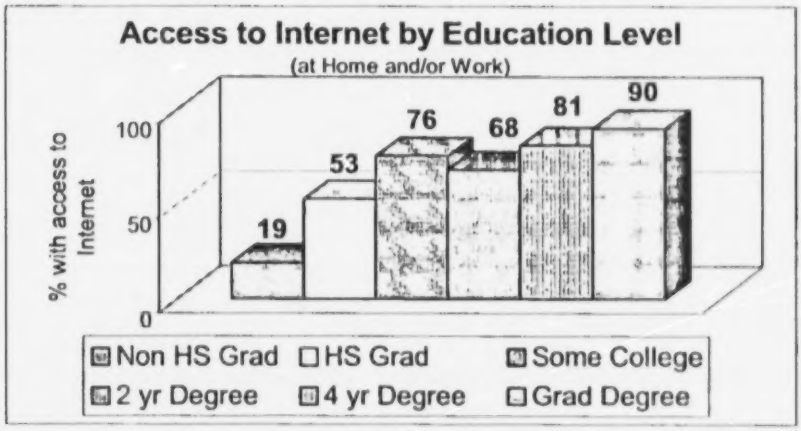

Chart 9

Nearly 50% of all respondents said they have access to the Internet at work, with suburban residents reporting the highest rate of access with 55%. The rate of access for urban areas was 43% and for rural areas was 47%. But rural residents in rural counties are much less likely to have access to the Internet at work than even rural residents who live in urban counties. Urban residents are 2 times more likely than rural residents to have access to the Internet at a community center or a public access terminal. Urban residents are also more likely than rural residents to have access at public libraries.

Those who responded that they have access to the Internet at school were predominately from suburban Pennsylvania. Of suburban Internet users, 25% said they access the Internet at school. Urban users responded with 18%, and only 17% of rural users noted Internet access at school (Note: The data in this report includes information from those ages 18 and above).

Accessing State of Pennsylvania Websites/Political Websites:
Given the substantial number of Pennsylvania agencies and governmental services now available on the Internet, residents were asked if they ever "visited" those Internet resources. Nearly 30% of the residents surveyed responded that they had visited these sites. Websites most frequently mentioned: Pennsylvania homepage, the Department of Transportation, the Department of Revenue/Treasury, the Department of Education, state senator, governor's page, Pennsylvania state parks, and the Department of Environmental Protection. The Commonwealth's investment into providing citizens with "digital access" seems to be off to a good start.

As noted above, 23% of residents reported that they use the Internet to "seek political information." This survey also asked the participants if they had ever visited the website of a political candidate. Almost 11% of residents reported they have visited a political campaign website (see Chart 10). Men are 2 times more likely than women to have viewed these sites. Income also appears to be a significant predictor of those who view political campaign sites, with those with incomes over $75,000 being twice as likely as the state average. Whether accessing Pennsylvania state websites, or accessing political websites, urban, suburban, and rural residents use these websites at a very similar level. When looking at the data arranged by county, there is very little difference between rural and urban counties for visiting these sites.

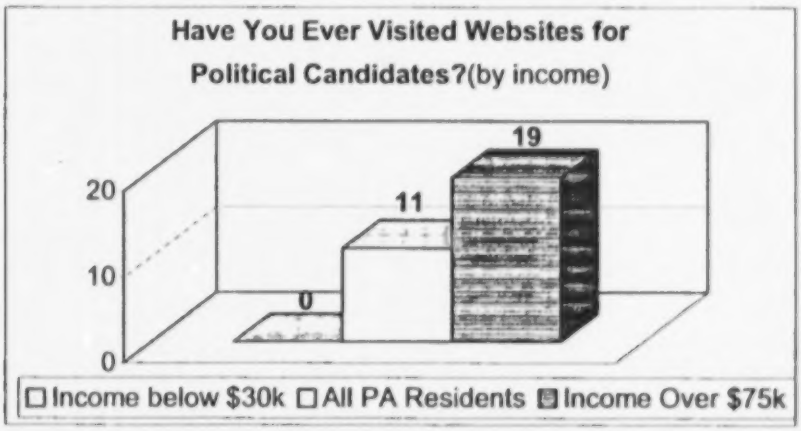

Chart 10
NOTE: "All PA Residents" = regardless of income

The data also suggests that age is a factor. In fact, individuals under the age of 40 are more than 2 times more likely than those over 40 to have visited political campaign websites (see chart 11). When asked which sites were visited, most frequent responses

included: presidential candidates (50%), White House (7%), U.S. Senate candidates (5%), Democratic Party (3%), Republican Party (3%), gubernatorial candidates (3%), U.S. Congress candidates (3%).

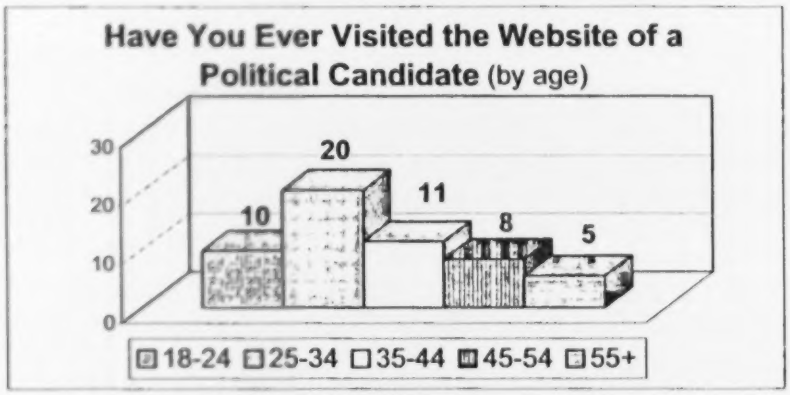

Chart 11

Internet Service Providers:
Survey participants were asked how they connected to the Internet (over 97% by telephone line), and what type of Internet Service Provider (ISP) they used. One significant difference appeared in the data. Of all demographic groups, rural residents are much more likely to use "local" ISP's rather than "national" companies. Every other group (by region, race, income, education, etc) has more people accessing the Internet by "national" companies (such as AOL). While overall, AOL is the most frequently used ISP in Pennsylvania (over 33% of all households use AOL), rural residents are predominately served by local companies. The Pennsylvania Technology Atlas also provides some important information. According to the Atlas, residents in urban counties have an average of 18 ISP's to choose from, while residents in rural counties have an average of only 3.5 ISP's. This suggests that competition (and therefore opportunities for recouping costs and establishing profit) may be more likely in the urban counties of the Commonwealth (see: http://www.technology.state.pa.us/atlas).

Reasons for Not Accessing the Internet:
Residents, who do not have access to the Internet, were asked to explain why they did not. There are some clear differences as to why some Pennsylvanians do not have access. While some residents from all regions of the Commonwealth selected "too expensive," this response was much more likely to come from urban residents than from rural residents (see Chart 12).

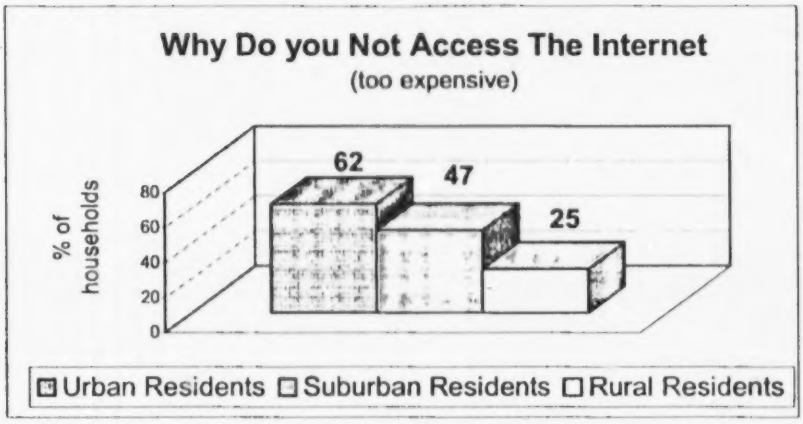

Chart 12

Some residents also cited "lack of access" in their area as the reason they do not have the Internet in their homes. No urban residents surveyed in this study selected lack of access, while 1 out of 5 suburban and 1 out of 4 rural residents did choose this response (see Chart 13). This indicates a very different pattern for not being "online", and it seems to be related to the area in which residents live.

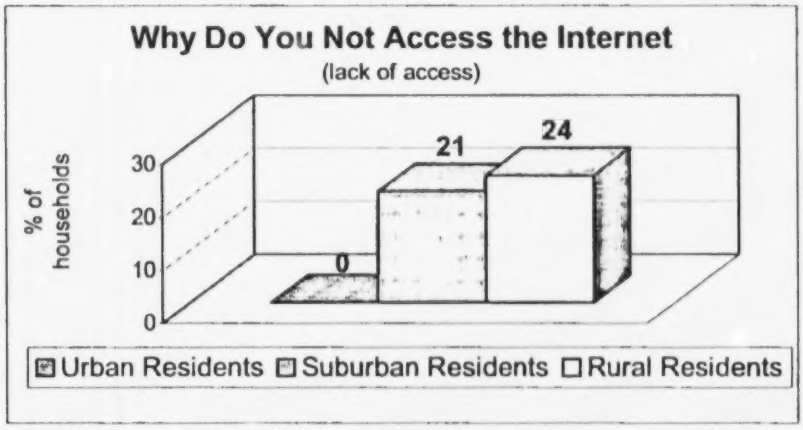

Chart 13

The third major reason why some Pennsylvanians do not have the Internet at home is that the Internet connection available to them is "too slow." Again, rural Pennsylvanians are the most likely to note this as a reason for not having the Internet in their homes. Suburban residents also cited this reason, and no urban residents selected this option (see Chart 14).

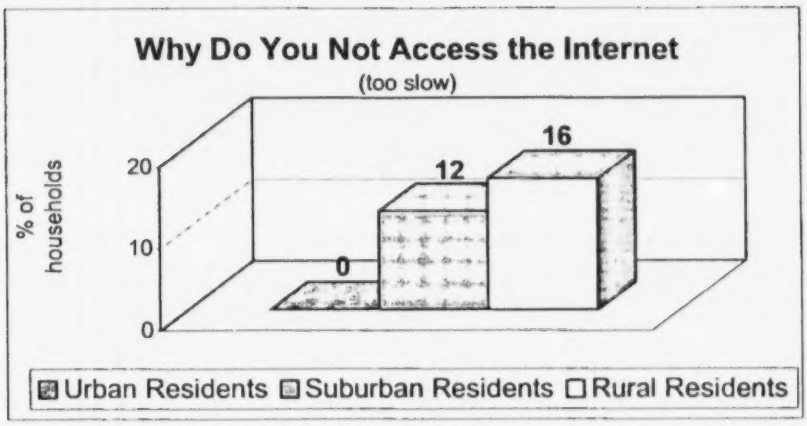

Chart 14

Summary of Findings Regarding Internet Access

Use of the Internet and its availability have clearly continued to grow in all areas and across all segments of the population, but in urban and rural areas there are still those who remain among the most disadvantaged, but for different reasons. Urban residents find that the economics of having the Internet is the primary roadblock to access. Rural residents also site expense as a reason, but are much more likely to have problems with access and are slightly more likely to complain about the lack of high-speed access. The ways in which urban and rural residents learn how to use the Internet are also different. It is encouraging to find nearly one-third of residents have accessed governmental or services/information online, with about 1 in 10 using the Internet for political information.

Conclusions and Recommendations:

There is much to be encouraged about in the data presented in this report, and some areas that continue to raise concern. There is evidence that access to personal computers and the Internet continues to increase across all demographic groups. The data demonstrates that education is a key element in not only having access to these technologies, but also in having individuals feel more comfortable with new technologies.

The data suggests that different strategies for helping citizens learn about computers and the Internet are needed. Recall the data that shows urban residents have greater Internet availability at libraries, community centers, and public terminals – whereas rural residents are more likely to be exposed to the Internet by a family member. Internet access in the workplace seems to have spread throughout the Commonwealth, and yet rural residents in rural counties are only half as likely as other Pennsylvanians to have such access at work. The least educated and least economically secure are still the least likely to have access at any location. The data may also suggest that rural and urban schools are not yet as "wired" as their suburban counterparts. This may be an area where

comparative data on school districts should be examined to see if there are public policy decisions, which might be more effective, could be implemented.

While a number of citizens still feel these technologies are "too expensive," this difference is clearly regional. Urban residents are the most likely group to be concerned about the economic factor, while it is rural residents who are most concerned about the lack of access as well as the speed of access.

Last year the Federal Communication Commission published its first "broadband survey," which examined how much progress is being made nationally with developing high-speed Internet connections. The report cites data that from 1998 to 1999 broadband access tripled – from .3% in 1998 to just about 1% in 1999. Cable and Digital Subscriber Lines are still insignificant contributors to the nation's demand for high-speed access. The FCC data seems to be reflected in the patterns of high-speed access in Pennsylvania, where nearly 98% of all Internet access is by conventional dial-up phone connections. The FCC report recommends continued "regulatory restraint" during what is still the infancy of this new technology, and includes a warning against inconsistent regulation at the state and local levels.

While current use of these technologies are insignificant, a recent study showed that 75 percent of households currently online would get high-speed access to the Internet through cable or DSL if it were available in their area (see: http://www.techtv.com/techtvnews/ specialreport/story/0,3685,3005568,00.html. While these technologies (satellite, DSL, cable) account for less than 3% of the Internet access in the Commonwealth, there is every reason to believe that as they become more available, they will attract Internet users. This is indicated in the data presented here, by the number of people who expressed concern over the lack of high-speed access. As the Internet continues to evolve and grow, the demand for faster access and greater processor speed will drive demand for these services much higher than current levels. The FCC had invited test data and other reports on high-speed access and was to be submitted for review by October 31, 2000. This data will be the basis for new FCC recommendations and rulings regarding high-speed access.

With the considerable resources the state has placed into developing these new technologies, research into how the citizens of the Commonwealth are using them is necessary for public policy decisions to be made with the most complete information possible. Since 1995, citizens have seen the development of the Pennsylvania homepage, and the creation of the Office of Administration and Information Technology, the legislative committees on Technology and Communication, Cyberstart (the initiative for Internet Education for Preschoolers), the Link-to-Learn program, technology initiatives in education at every level, the Pennsylvania Technology Atlas, and the Digital Grassroots Initiative. Citizens may also access the Internet for 'published' state documents and statistics, and visit both houses of the Legislature online. These are just some of the examples of the commitment and dedication of both elected representatives and professional staff in the Commonwealth who are intent on guaranteeing that the citizens of Pennsylvania will have access to the very latest information technologies.

Examining how many people "visit" the state's websites gives some cause for optimism. The Pennsylvania Internet Development Newsletter (Aug. 16, 2000) reported an analysis of the numbers of visitors to the Commonwealth's official websites, and noted that traffic to some sites is double that of 1999. Not surprisingly the "traffic" to Pennsylvania's homepage in 2000 averaged about 90,000 visitors per month (see:http://brain.hbg.psu.edu/psdc/statistics/psdc_stat_accum.html).

Many of those who had fallen behind and were part of the "digital divide," have actually begun to catch up, as the numbers of personal computers and Internet access for rural, poor, and elderly residents have been increasing. However, new problems loom on the horizon. As higher speed connections become available, they are being installed in urban and suburban areas first, because they are – at the moment – economically more viable in areas with greater concentrations of homes and businesses. Digital Subscriber Lines (DSL) offer much faster connections but require the subscriber to be within two miles of a telephone relay station. Both DSL and cable connections require a provider to invest significant resources to extend services to residents, and will require assurance of a profitable return.

It is not surprising then, that residents of rural Pennsylvania are already expressing concern over issues of access and the lack of high-speed connections. Rural areas will become even more disadvantaged during the switch over to higher speed access. Cost of higher speed access may raise new barriers to not only rural but also other Pennsylvanian's ability to achieve technological parity at home, work, and at school. For example, high-speed access by DSL costs $40 - $50 per month, and for installation and hardware about $200. This does not include the cost of an Internet Service Provider (ISP), which is still needed to connect to the Internet. Satellite or cable connections also will require both installation and monthly service fees.

Some attention should be given to the role the state may play in assuring citizens that they will not once again fall behind as the next surge in technology (high-speed access) comes to the Commonwealth. Lessons from the first "digital divide" should assist us in planning how to deal with – or perhaps even prevent - the next one. Some possibilities for addressing these issues would include:

1. Either through hearings (perhaps held by the PUC or the Legislature), or convening a commission – investigate what the Telecom, cable, and satellite industries would find useful as incentives for expansion of high-speed access into rural areas. Obviously the most important agency in this effort is the FCC, and their continued support for regulatory restraint and simplifying the application process is vital to the expansion of the broadband industry. A state initiative in this regard might provide the FCC with additional information or even a model for other states to follow. Given the needs of the Commonwealth, the state should be an active partner in the effort to find ways to expand high-speed service. Important questions to be answered include: are there regulatory or tax incentives that would be appropriate and useful; are there recommendations the state could make to federal agencies (especially the FCC) that could assist the

Commonwealth in this effort; and what specific actions can be taken and/or encouraged by the state to insure high-speed access will be available and affordable?

2. Investigate the possibility of repeating the "tax holiday" for Pennsylvania residents to purchase computers and related hardware in order to stimulate acquisition of equipment to give Telecom/cable/satellite operators greater confidence that their costs of expanding services would mean there will be a market of potential clients with personal computers ready to be connected to the Internet. Such a program could be coordinated with offers from the access providers.

3. Investigate how e-commerce operators might be persuaded to join the effort to expand high-speed access. Since residents in rural counties are even more likely than others to be engaged in shopping on the Internet, perhaps representatives of this burgeoning segment of the economy could encourage and assist in the expansion of access for rural counties.

4. Given the evidence that residents in rural counties do not have the same opportunity for learning about the Internet at work, a volunteer program that uses local libraries, schools, universities, or other wired facilities should be encouraged. Such a program might rely on the expertise of younger persons who are more engaged in the technology to introduce these older rural county residents to how to access and use the Internet. Such an initiative could be initiated/sponsored and publicized at the state level, but organized at the local county level with a minimum of cost.

This study is offered by the Center for Rural Pennsylvania as a "snap-shot" at the beginning of a new century, of the status of how personal computers and the Internet have penetrated into the everyday life of citizens of the Commonwealth. It also provides a database that can be used to compare future research that can assist in policy decisions and program evaluation, as Pennsylvania continues to be a leader in technology, education, and innovation in the 21st Century.

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The Center for Rural Pennsylvania is a bipartisan, bicameral legislative agency that serves as a resource for rural policy within the Pennsylvania General Assembly. It was created in 1987 under Act 16, the Rural Revitalization Act, to promote and sustain the vitality of Pennsylvania's rural and small communities. The Center seeks to preserve and enhance the rural environment, which makes the Commonwealth a unique place to live, work, or visit; awards grants for applied research and model projects; maintains and disseminates information on rural trends and conditions; develops publications to share research and project results; and sponsors local, state and national forums on rural issues.

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